WHAT IS CLAIMED IS:

1. A method of producing differentiated progenitor cells, comprising:

(I) obtaining morula-derived cells or inner cell mass cells from a blastocyst; and

(ii) inducing differentiation of the morula-derived cells or inner cell mass cells to produce differentiated progenitor cells.

2. The method according to claim 1 further comprising isolating said differentiated progenitor cells.

3. The method according to claim 1, wherein said morula-derived cells or inner cell mass cells are induced to differentiate in the absence of undifferentiated embryonic stem cells.

4. The method according to claim 1, wherein said blastocyst is produced by *in vitro* fertilization.

5. The method according to claim 1, wherein said blastocyst is a human blastocyst.

6. The method according to claim 1, wherein said blastocyst is produced from a nuclear transfer unit.

7. The method according to claim 6, wherein a desired DNA is inserted, removed or modified in said nuclear transfer unit, thereby resulting in the production of a genetically altered differentiated progenitor cell.

8. The method according to claim 1, wherein said inner cell mass cells are induced to differentiate in a flat adhesive environment.

9. The method according to claim 1, wherein said inner cell mass cells are induced to differentiate in a 3D adhesive environment.

10. The method according to claim 1, wherein said inner cell mass cells are induced to differentiate in a microgravity.

11. The method according to claim 1, wherein said inner cell mass cells are induced to differentiate by generation of teratomas in immunodeficient mice.

12. The method according to claim 1, wherein said inner cell mass cells are induced to differentiate by encapsulating said inner cell mass cells in an isogenic human patient and generating teratomas from said encapsulated cells.

13. The method according to claim 1, wherein said inner cell mass cells are induced to differentiate by encapsulating said inner cell mass cells in an allogeneic human patient and generating teratomas from said encapsulated cells.

14. The method according to claim 1, wherein the differentiated progenitor cell is derived from mesoderm.

15. The method according to claim 1, wherein the differentiated progenitor cell is derived from ectoderm.

16. The method according to claim 1, wherein the differentiated progenitor cell is derived from endoderm.

17. A differentiated progenitor cell obtained according to the method of claim 2.

18. The differentiated progenitor cell according to claim 17 which is a human differentiated progenitor cell.

19. A transgenic differentiated progenitor cell obtained according to claim 7.

20. The transgenic differentiated progenitor cell according to claim 19 which is a human transgenic differentiated progenitor cell.

21. A method of therapy which comprises administering to a patient in need of cell transplantation therapy isogenic differentiated cells according to claim 18.

22. The method of claim 21, wherein said cell transplantation therapy is effected to treat a disease or condition selected from the group consisting of Parkinson's disease, Huntington's disease, Alzheimer's disease, ALS, spinal cord defects or injuries, multiple sclerosis, muscular dystrophy, cystic fibrosis, liver disease, diabetes, heart disease, cartilage defects or injuries, burns, foot ulcers, vascular disease, urinary tract disease, AIDS and cancer.

23. The method of claim 21, wherein the differentiated human cells are hematopoietic cells or neural cells.

24. The method of claim 21, wherein the therapy is for treatment of Parkinson's disease and the differentiated cells are neural cells.

25. The method of claim 21, wherein the therapy is for the treatment of cancer and the differentiated cells are hematopoietic cells.

26. A method of therapy which comprises administering to a human patient in need of cell transplantation therapy xenogenic differentiated cells according to claim 17.

27. The method according to claim 23 wherein the xenogenic differentiated cells are bovine cells.

28. The method of claim 24, wherein said cell transplantation therapy is effected to treat a disease or condition selected from the group consisting of Parkinson's

disease, Huntington's disease, Alzheimer's disease, ALS, spinal cord defects or injuries, multiple sclerosis, muscular dystrophy, cystic fibrosis, liver disease, diabetes, heart disease, cartilage defects or injuries, burns, foot ulcers, vascular disease, urinary tract disease, AIDS and cancer.

29. A method of producing a lineage-defective embryonic stem cell, comprising:

I) genetically modifying a somatic cell such that said somatic cell is incapable of differentiating into a predetermined cell lineage;

ii) generating a nuclear transfer unit using the genetically modified somatic cell or cell nucleus as the nuclear donor;

iii) activating the resultant nuclear transfer unit;

iv) culturing said activated nuclear transfer unit until greater than the 2-cell developmental stage; and

v) culturing cells obtained from said cultured nuclear transfer unit under conditions suitable for the formation of a lineage-defective embryonic stem cell, said stem cell being unable to differentiate into at least one of the embryonic germ layers.

30. The method according to claim 29, wherein generating said nuclear transfer unit comprises inserting the genetically modified human somatic cell or cell nucleus into an enucleated mammalian oocyte under conditions suitable for formation of a nuclear transfer unit.

31. The method according to claim 29, wherein said lineage-defective human embryonic stem cell is incapable of differentiating into mesoderm.

32. The method according to claim 29, wherein said lineage-defective human embryonic stem cell is incapable of differentiating into endoderm.

33. The method according to claim 29, wherein said lineage-defective human embryonic stem cell is incapable of differentiating into ectoderm.

34. A lineage-defective human embryonic stem cell produced according to the method of claim 29.

35. The method according to claim 29, wherein said lineage-defective embryonic stem cell is human.